

Attorney Docket No.: J7177(C)  
Serial No.: 10/551,012  
Filed: June 27, 2006  
Confirmation No.: 1428

### **REMARKS**

The present amendment is submitted in an earnest effort to advance the case to issue without delay.

Claims 1 and 4-6 were identified as having grammatical errors. The Examiner has suggested and applicant has replaced the phrase "as abrasive" with "an abrasive". Further, claims 4-6 were indicated to be grammatically incorrect in the phrases "of from" or "at from". Appropriate correction has been submitted.

Claim 7 was rejected under 35 U.S.C. § 112, second paragraph for failing to provide any steps involved in the method/process. Applicant has now canceled this claim.

Claim 7 was rejected under 35 U.S.C. § 101 as being an improper definition of a process. Again, applicant notes that this claim has been canceled.

Claim 1 has been amended to more sharply define the invention. The lanthanide metal oxide has been identified as cerium oxide. Support is found in the Example. The further abrasive has been identified as silica and concentrations recited. Support is found in original claim 6 now incorporated into the independent claim 1.

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Claims 1-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McArdle et al. (U.S. Patent 6,620,214) in view of Gunnar et al. (GB 2 001 849 A). Applicant traverses this rejection.

The present invention provides an improved abrasive system for use in dentifrices such as toothpastes and tooth gels. Applicant has found that certain lanthanide metal oxides in combination with an abrasive such as silica are a particularly effective cleaning combination.

A set of comparative experiments have been presented in the specification under the Example. The Table therein reveals that inclusion of cerium oxide into a standard abrasive silica toothpaste results in a much improved PCR value. Compare the control (73.18) to the cerium oxide formula (90.96) in PCR value. Against expectation, the RDA value of 87.3 for the cerium oxide did not deviate much from the control, the latter having an 88.45 RDA. Lanthanum oxide also improved the PCR (79.45) of the control toothpaste. However, the increase was much less than that observed with the cerium oxide.

McArdle et al. was cited for disclosing ceramic powders useful for a variety of purposes including dental uses. The reference identifies ceramic abrasives as comprising alumina and, optionally, a metal oxide modifier. Amongst the list are "lanthanum oxide" and "ceria". See column 9, lines 22-25. There also is a disclosure with respect to average particle size in the range from about 0.5 to

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about 1500 micrometer. A skilled person in the art would understand from the foregoing disclosure that the primary ceramic abrasive must be that of alumina. This same skilled chemist then could optionally select from a list of another dozen metal oxide modifiers. Lanthanum oxide and ceria are amongst the list.

Applicant has demonstrated that cerium and lanthanum oxide each in combination with silica provide a better abrasive result. However, the cerium oxide combination is substantially better than the lanthanum oxide one. It would not at all be apparent from McArdle to select cerium oxide over the adjacently listed lanthanum oxide or any other listed oxide modifier.

Gunnar et al. was introduced for teaching that lanthanides and their salts can be used as antiplaque agents. The reference states that the lanthanides which include cerium and lanthanum "are very closely related chemically". See page 1, line 32. The skilled chemist would have expected that no difference would be found in cerium from that of lanthanum.

Indeed, Gunnar et al. much prefers the lanthanum cation over any other metal in the lanthanum family. See page 1, lines 47-48. Noteworthy is that the Examples feature lanthanum chloride, with also a reference to gadolinium and ytterbium chlorides. No mention is made of cerium or its oxide. In fact, Gunnar et al. makes absolutely no mention of any lanthanide oxide for use with a dental composition.

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A combination of McArdle et al. in view of Gunnar et al. would not render the instant invention obvious. Applicant has shown that there is benefit of a cerium oxide and silica combination. This benefit is greater than with silica and lanthanum oxide. Anyone reviewing McArdle would not have been led to the conclusion that cerium amongst all the lanthanides (and lanthanum itself being prime example) would have any special abrasive properties. Gunnar et al. emphasizes the prejudice toward lanthanum (although not at all mentioning the oxide of any of the lanthanides). For these reasons, there would have been little motivation for the skilled chemist to select a cerium oxide in any further combination with the silica to achieve an improved abrasive toothpaste result.

Claims 1-7 were rejected under 35 U.S.C. § 103(a) over Harcum et al. (U.S. Patent 6,258,342 B1) in view of Gunnar et al. (GB 2 001 849 A) and McArdle (U.S. Patent 6,258,342). Applicant traverses this rejection.

Harcum et al. was introduced for disclosing a process to make toothpaste using agglomerated dispersible polymers. The Examiner admits that this reference lacks the mention of lanthanum oxide or cerium oxide as abrasives. Gunnar et al. and McArdle et al. were relied upon for remedying these deficiencies.

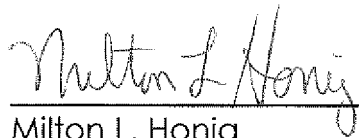
Applicant has shown *vide supra* that the beneficial effects of cerium oxide relative to lanthanum oxide is quite unexpected. Gunnar et al. particularly prefers the lanthanum cation. Nothing is mentioned in that reference with

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respect to any oxides. McArdle is primarily an alumina ceramic abrasive. Optionally a metal oxide modifier may be incorporated, and many of these are in the lanthanide family. Lanthanum oxide and ceria are placed adjacent one another in a listing of modifier materials. There is no suggestion that silica in combination with either of these "modifiers" would have any particular improved abrasive effect. Even more so, there is no teaching or suggestion in McArdle to support the better performance of cerium oxide over the lanthanum oxide. The combination of references simply does not suggest, motivate, teach or in any other way direct a skilled chemist at the presently claimed invention.

In view of the foregoing amendment and comments, applicant requests the Examiner to reconsider the rejection and now allow the claims.

Respectfully submitted,



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